

REMARKS

On December 21, 2007, a Pre-Appeal Brief Request for Review was filed in response to the Advisory Action mailed on December 13, 2007. On January 22, 2008, a Notice of Panel Decision from Pre-Appeal Brief Review was mailed indicating that the rejection would be withdrawn and a new action would be mailed. On March 13, 2008, Examiner issued this Non-Final Office Action. Reconsideration of the present application in view of the following remarks is respectfully requested.

Claim Rejections – 35 U.S.C. §103(a)

Independent claim 1 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Materials Mechanics – The Basis of Advanced Technology for Ageing Aircraft*: Boller, 2001, Werkstofftech, 32, pages 388-397 (hereinafter referred to as Boller) in view of *Integrated decision support for aviation safety inspectors*: Luxhoj, 1996, Elsevier, Finite elements in analysis and design, pages 381-403 (hereinafter referred to as Luxhoj), in view of *Elements of Artificial Neural Networks*, authored by Kishan Mehrotra et al (hereinafter referred to as Mehrotra).

Reconsideration of the rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Boller in view of Luxhoj, in view of Mehrotra is respectfully requested. The Examiner argues that Boller alone teaches an aeroelastic analysis system comprising an input module configured to receive one or more input parameters associated with aeroelastic characteristics of a structure, and a neural network module coupled to the input module and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic analysis result. The Examiner states that "aeroelastic characteristics" is equivalent to "aeroelasticity" of Boller at p396, C2:19-34. However, Boller is not even directed to aeroelastic analysis, and instead, is directed to the determination and use of operational loads

monitoring regarding fatigue life evaluation. *See* Boller, Abstract, pg. 388. Boller fails to describe any aeroelastic analysis because Boller is directed to determining the stage of damage in a structure. *Id.* at pg. 389. In fact, in the "Conclusions" on page 396, to which the Examiner cites, Boller even states that "[i]t will not take very long until further digital models will be included such as used for aerodynamics, *aeroelasticity*, loads and strength," (*Id.* at pg. 39) (emphasis added), indicating that developing digital models based on aeroelastic characteristics is not something Boller had yet accomplished, and therefore certainly had not discussed in this document. In fact this is the only mention of aeroelasticity in the entire document. There is no description in page 396 of Boller of a system performing an "aeroelastic analysis" to produce an "aeroelastic result" as claimed in claim 1. Therefore, Applicant respectfully submits that Boller does not teach an input module configured to receive one or more input parameters associated with aeroelastic characteristics of a structure, nor a neural network module coupled to the input module and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic analysis result. Similarly, Mehrotra does not teach "a transformation of the . . . input parameters to produce at least one aeroelastic result."

Admittedly, Boller does not teach either that the one or more input parameters be related to a completed repair of the structure, or that the at least one aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable. Instead, the Examiner argues that Luxhoj teaches these elements, citing pg. 382, ll. 1-24, and that it would have been obvious to a person having ordinary skill in the art at the time of Applicant's invention to modify the teachings of Boller by inputting data as taught by Luxhoj to have one or more input parameters relating to a completed repair of the structure, and by finding aeroelastic analysis as taught by Luxhoj wherein the at least one aeroelastic result

may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable.

First of all, the section of Luxhoj cited by the Examiner does not teach inputting parameters related to the completed repair of a structure into an input module, but merely states that there was a need for improved methods for accurate prediction of residual life of repaired structures. The remainder of Luxhoj is directed to a prediction method for forecasting removal and inspection dates for structure components related to such things as corrosion or cracking based on flight hours, landings, and the age of the plane. These are not parameters related to completed repairs on a structure, and Luxhoj did not teach any such parameters.

Secondly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to using an aeroelastic analysis result to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable. The Examiner equates the determination of whether the aeroelastic characteristics of the completed repair are acceptable with the word "airworthiness" in Luxhoj. Again, Luxhoj merely suggests a need for improved methods for accurate prediction of residual life of repaired structures, and does not actually teach anything to do with performing an aeroelastic analysis and using the result of that aeroelastic analysis to determine whether the aeroelastic characteristics of a completed repair on a structure are acceptable. Therefore, Applicant respectfully submits that even if a combination of Boller and Luxhoj were made, which Applicant does not concede is proper, the purported combination would not disclose that the one or more input parameters be related to a completed repair of the structure, or that the at least one aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable. Similarly, Mehrotra does not teach that "aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable."

Therefore, for at least these reasons, Applicant respectfully submits that even if a combination of Boller and Luxhoj and Mehrotra were made, which Applicant does not concede is proper, the purported combination would not disclose all of the elements of independent claim 1. As a result, claim 1 is allowable over Boller in View of Luxhoj, and in view of Mehrotra. Claims 2-13 and 31-35 which depend from allowable independent claim 1 are therefore also allowable.

Independent claims 17, 21, 28, 29 and 30 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Boller, Luxhoj and Mehrotra in view of *Small Business Innovation Research to Support Aging Aircraft, Priority Technical Areas and Process Improvements*, published by the National Academy of Sciences, Publication NMAB-497 (hereinafter referred to as NMAB). Reconsideration of the rejection of claims 17, 21, 28, 29 and 30 under 35 U.S.C. §103(a) as being unpatentable over Boller, Luxhoj and Mehrotra in view of NMAB is respectfully requested.

Regarding independent claim 17 applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Admittedly, Boller and Luxhoj and Mehrotra do not teach "determining input parameters relating to one or more completed repairs performed on a structure." The Examiner argues that it would have been obvious to a person having ordinary skill in the art at the time of Applicant's invention to modify the combined teachings of Boller, Luxhoj and Mehrotra by inputting repair information as taught by NMAB to determine input parameters relating to one or more completed repairs performed on a structure. The Examiner states that "input parameters relating to one or more completed repairs performed on a structure" of claim 17 is illustrated by "materials and processes" in NMAB, p11:8-25. However, page 11 of NMAB says nothing about "input parameters" or "input parameters relating to a completed repair of the structure." In fact, not a single "input parameter" is disclosed on page 11 of NMAB.

The "materials and processes" referred to by Examiner relates to the appointment of "a committee of experts in . . . materials and processes." NMAB-497, p11:22-25.

Further, regarding claim 17, Examiner states that "the aeroelastic characteristics" is equivalent to "aeroelasticity" of Boller at page 396, C2:19-34, and that Luxhoj teaches determining whether the aeroelastic characteristics of the structure with the one or more completed repairs are acceptable at page 382, ll. 1-24. However, as discussed above, Boller is not at all directed to aeroelastic analysis, there is no description in page 396 of Boller of a method to determine the "aeroelastic characteristics" of the structure as claimed in claim 17. Similarly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to determining whether the aeroelastic characteristics of the structure with the completed repairs are acceptable.

Therefore, for at least these reasons, Applicant respectfully submits that even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 17. As a result, claim 17 is allowable over Boller, Luxhoj, and Mehrotra in view of NMAB. Claims 18-20 and 36-41, which depend from allowable independent claim 17, are therefore also allowable.

Regarding independent claim 21, applicant respectfully reiterates the remarks set forth above regarding independent claims 1 and 17. Boller, Luxhoj, Mehrotra, and NMAB do not teach at least "receiving at least one input parameter related to a completed repair of an aircraft structure," an "aeroelastic analysis result," or that "the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight."

In addition, Examiner states that "receiving at least one input parameter related to a completed repair of an aircraft structure" of claim 21 is illustrated by "materials and processes"

in NMAB, p11:8-25. However, page 11 of NMAB says nothing about an "input parameter" or an "input parameter related to a completed repair of an aircraft structure." In fact, not a single "input parameter" is disclosed on page 11 of NMAB. NMAB makes clear that the "materials and processes" referred to by Examiner relates to the appointment of "a committee of experts in . . . materials and processes." NMAB-497, p11:22-25. Admittedly, Boller, Luxhoj and Mehrotra do not disclose "receiving at least one input parameter related to a completed repair of an aircraft structure" either.

Further, regarding claim 21, Examiner states that "the aeroelastic analysis result" is equivalent to "aeroelasticity" of Boller at page 396, C2:19-34, and that Luxhoj teaches determining whether the aeroelastic characteristics of the structure with the one or more completed repairs are acceptable at page 382, ll. 1-24. However, as discussed above, Boller is not at all directed to aeroelastic analysis, there is no description in page 396 of Boller of a method to determine the "aeroelastic characteristics" of the structure as claimed in claim 21. Similarly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to determining whether the aeroelastic characteristics of the structure with the completed repairs are acceptable.

Therefore, for at least these reasons, Applicant respectfully submits that even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 21. As a result, claim 21 is allowable over Boller, Luxhoj, and Mehrotra in view of NMAB. Claims 22-27 and 42-44, which depend from allowable independent claim 21, are therefore also allowable.

Regarding independent claim 28, applicant respectfully reiterates the remarks set forth above regarding independent claims 1, 17 and 21. Further, even if a combination of Boller,

Luxhoj, Mehrotra, and NMAB were made the purported combination still would not disclose all of the elements of claim 28. Boller, Luxhoj, Mehrotra, and NMAB do not teach at least "receiving at least one input parameter related to a completed repair of an aircraft structure," "an aeroelastic analysis result," and "the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight."

The Examiner states that "receiving at least one input parameter related to a completed repair of an aircraft structure" of claim 28 is illustrated by "materials and processes" in NMAB, p11:8-25. However, page 11 of NMAB says nothing about an "input parameter" or an "input parameter related to a completed repair of an aircraft structure." In fact, not a single "input parameter" is disclosed on page 11 of NMAB. NMAB makes clear that the "materials and processes" referred to by Examiner relates to the appointment of "a committee of experts in . . . materials and processes." NMAB-497, p11:22-25. Admittedly, Boller, Luxhoj and Mehrotra do not disclose "receiving at least one input parameter related to a completed repair of an aircraft structure" either.

Further, regarding claim 28, Examiner states that "the aeroelastic analysis result" is equivalent to "aeroelasticity" of Boller at page 396, C2:19-34, and that Luxhoj teaches using the aeroelastic analysis result to determine whether the aircraft structure with the completed repair is acceptable for flight at page 382, ll. 1-24. However, as discussed above, Boller is not at all directed to aeroelastic analysis, there is no description in page 396 of Boller of a method to determine the "aeroelastic characteristics" of the structure as claimed in claim 28. Similarly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to using the result of an aeroelastic analysis to determine whether the aircraft structure with the completed repair is acceptable for flight.

Therefore, for at least these reasons, Applicant respectfully submits that even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 28. As a result, claim 28 is allowable over Boller, Luxhoj, and Mehrotra in view of NMAB. Claims 22-27 and 42-44, which depend from allowable independent claim 21, are therefore also allowable. Claims 45-48, which depend from allowable independent claim 28, are therefore also allowable.

Regarding independent claim 29, applicant respectfully reiterates the remarks set forth above regarding independent claims 1, 17, 21 and 28. Further, even if a combination of Boller, Luxhoj, Mehrotra, and NMAB were made the purported combination still would not disclose all of the elements of claim 29. Boller, Luxhoj, Mehrotra, and NMAB do not teach at least "receiving a mass input related to a completed repair," "generate an aeroelastic analysis flutter result," and "the aeroelastic analysis flutter result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight."

In addition, Examiner states that "receiving a mass input related to a completed repair," and "receiving a location of the mass on an aircraft structure" of claim 29 is illustrated by "materials and processes" in NMAB, p11:8-25. However, page 11 of NMAB says nothing about a "mass input" or a "mass input related to a completed repair" or "receiving a location of the mass input on an aircraft structure." In fact, not a single "input" is disclosed on page 11 of NMAB. NMAB makes clear that the "materials and processes" referred to by Examiner relates to the appointment of "a committee of experts in . . . materials and processes." NMAB-497, p11:22-25. Admittedly, Boller, Luxhoj and Mehrotra do not teach "receiving a mass input related to a completed repair" or "receiving a location of the mass on an aircraft structure" either.

Further, regarding claim 29, Examiner states that "the aeroelastic analysis flutter result" is equivalent to "aeroelasticity" of Boller at p396, C2:19-34, and that Luxhoj teaches using the aeroelastic analysis flutter result to determine whether the aircraft structure with the completed repair is acceptable for flight at page 382, ll. 1-24. However, as discussed above, Boller is not at all directed to aeroelastic analysis, there is no description in page 396 of Boller of a method to "generate an aeroelastic analysis flutter result" as claimed in claim 29. Similarly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to determining whether the aircraft structure with the completed repair is acceptable for flight.

Therefore, for at least these reasons, even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 29. As a result, claim 29 is allowable over the combination of Boller, Luxhoj and Mehrotra in view of NMAB. Claims 49-51, which depend from allowable independent claim 29, are therefore also allowable.

Regarding independent claim 30, applicant respectfully reiterates the remarks set forth above regarding independent claims 1, 17, 21, 28 and 29. Further, even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, the purported combination still would not disclose all of the elements of claim 30. Boller, Luxhoj, Mehrotra and NMAB do not teach at least "means for receiving input parameters related to a completed repair of an aircraft structure," an "aeroelastic analysis result," and "the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight."

The Examiner states that "means for receiving input parameters related to a completed repair of an aircraft structure" of claim 30 is illustrated by "materials and processes" in NMAB, p11:8-25. However, page 11 of NMAB says nothing about "input parameters" or an "input parameters related to a completed repair of an aircraft structure." In fact, not a single "input

parameter" is disclosed on page 11 of NMAB. NMAB makes clear that the "materials and processes" referred to by Examiner relates to the appointment of "a committee of experts in . . . materials and processes." NMAB-497, p11:22-25. Admittedly, Boller, Luxhoj and Mehrotra do not teach "means for receiving input parameters related to a completed repair of an aircraft structure."

Further, regarding claim 30, Examiner states that the "aeroelastic analysis result" is equivalent to "aeroelasticity" of Boller at page 396, C2:19-34, and that Luxhoj teaches using the aeroelastic analysis result to determine whether the aircraft structure with the completed repair is acceptable for flight at page 382, ll. 1-24. However, as discussed above, Boller is not at all directed to aeroelastic analysis, there is no description in page 396 of Boller of a method to determine the "aeroelastic characteristics" of the structure as claimed in claim 28. Similarly, Luxhoj is not directed to aeroelastic analysis, and thus there is no disclosure as to using the result of an aeroelastic analysis to determine whether the aircraft structure with the completed repair is acceptable for flight.

Therefore, for at least these reasons, even if a combination of Boller, Luxhoj, Mehrotra and NMAB were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 30. As a result, claim 30 is allowable over the combination of Boller, Luxhoj and Mehrotra in view of NMAB. Claims 52-55, which depend from allowable independent claim 30, are therefore also allowable.

Conclusion

In view of the aforesaid, reconsideration and allowance of all claims at issue are respectfully solicited.

Respectfully submitted,

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